Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-23. (Cancelled)

23. (Currently amended) A rolling cone rock bit, comprising:

a drill bit body having a circumference, and defining a longitudinal axis, a top, a bottom, and a gage diameter;

~~a nozzle boss having a bottom and a top;~~

a first leg formed from said drill bit body, said first leg providing a mud flow ramp from a leading edge of said first leg, wherein said mud flow ramp comprises a top, a first section, and a second section connected serially to said first section, wherein said first and second sections are ~~is~~ disposed at different ~~an~~ angles to a line perpendicular to said longitudinal axis, ~~at least a portion of said mud flow ramp being at an angle from 10 degrees to 80 degrees to said longitudinal axis, and wherein said mud flow ramp has a top;~~

inserts extending to substantially gage diameter, said inserts located from 150 degrees to 360 degrees around said circumference of said drill bit body;

a junk slot defined by said mudflow ramp, said drill bit body, and a junk slot boundary line; and

a first rolling cone rotatably attached to said drill bit body.~~;~~

~~wherein said junk slot has a cross-sectional area at each height along said junk slot and said cross-sectional area of said junk slot is greater at its top than at its bottom, and wherein a cross-sectional area exists between said nozzle boss and said mudflow ramp, said~~

~~cross-sectional area increasing from said bottom of said nozzle boss to said top of said nozzle boss.~~

24. (Currently amended) The rolling cone rock bit of claim 23, further comprising:

a nozzle boss formed from said drill bit body, said nozzle boss having a bottom, a top, and a sidewall;

wherein said junk slot is further defined by said nozzle boss sidewall, wherein said junk slot has a cross-sectional area at each height along said junk slot, and wherein a cross-sectional area exists between said nozzle boss and said mudflow ramp, said cross-sectional area increasing from said bottom of said nozzle boss to said top of said nozzle boss.~~and where said cross-sectional area of said junk slot is greater at said top of said mud ramp than at said bottom of said nozzle boss.~~

25. (Original) The rolling cone rock bit of claim 23, wherein said junk slot boundary line is defined by the rotational movement of an outermost point on said first leg.

26. (Previously presented) A rolling cone rock bit, comprising:

a drill bit body defining a longitudinal axis, a top, and a bottom;

a first leg formed from said drill bit body, said first leg providing a mud flow ramp from a leading edge of said first leg, wherein said mud flow ramp is disposed at an angle to said longitudinal axis, and wherein said mud flow ramp has a top;

a junk slot defined by said mudflow ramp, drill bit body, and a junk slot boundary line;

a first rolling cone rotatably attached to said drill bit body,

wherein said junk slot has a cross-sectional area at each height along said junk slot and said cross-sectional area of said junk slot is greater at its top than at its bottom;

a second leg formed from said drill bit body, said second leg being adjacent to but leading said first leg,

wherein said nozzle boss is forms a side of said second leg.

27. (Previously presented) The rolling cone rock bit of claim 26, wherein one side wall of every leg of said rolling cone rock bit is also a side of a nozzle boss.

28. (Currently amended) The rolling cone rock bit of claim 23, wherein said ~~mud ramp includes~~ ~~a~~ first section is a straight section and said ~~a~~ second section is straight ~~section~~, said first and second straight sections being at different angles to said line perpendicular to said longitudinal axis.

29. (Original) The rolling cone rock bit of claim 28, wherein said first and second straight sections are disposed from said longitudinal axis between 0 and 80 degrees.

30. (Original) The rolling cone rock bit of claim 29, wherein said first and second straight sections are disposed from said longitudinal axis between 10 and 80 degrees.

31. (Original) The rolling cone rock bit of claim 29, wherein said first and second straight sections are disposed from said longitudinal axis between 0 and 60 degrees.

32. (Original) The rolling cone rock bit of claim 29, wherein said first and second straight sections are connected with a fillet surface.

33. (Cancelled)

34. (Original) The rolling cone rock bit of claim 23, wherein said mud flow ramp includes a concave section.

35. (Currently Amended) ~~The rolling cone rock bit of claim 23,~~ A rolling cone rock bit, comprising:

a drill bit body defining a longitudinal axis, a top, and a bottom;

a nozzle boss having a bottom and a top;

a first leg formed from said drill bit body, said first leg providing a mud flow ramp from a leading edge of said first leg, wherein said mud flow ramp is disposed at an angle to said longitudinal axis, at least a portion of said mud flow ramp being at an angle from 10 degrees to 80 degrees to a line perpendicular to said longitudinal axis, and wherein said mud flow ramp has a top and ~~wherein said mud flow ramp includes~~ a convex section;

a junk slot defined by said mudflow ramp, drill bit body, and a junk slot boundary line;

a first rolling cone rotatably attached to said drill bit body,

wherein said junk slot has a cross-sectional area at each height along said junk slot and said cross-sectional area of said junk slot is greater at its top than at its bottom, and wherein a cross-

sectional area exists between said nozzle boss and said mudflow ramp, said cross-sectional area increasing from said bottom of said nozzle boss to said top of said nozzle boss.

36. (Original) ~~The rolling cone rock bit of claim 23,~~ A rolling cone rock bit, comprising:

a drill bit body defining a longitudinal axis, a top, and a bottom;

a nozzle boss having a bottom and a top;

a first leg formed from said drill bit body, said first leg providing a mud flow ramp from a leading edge of said first leg, ~~wherein~~ said mud flow ramp ~~is~~ being a set of continuous curves, wherein said mud flow ramp is disposed at an angle to said longitudinal axis, at least a portion of said mud flow ramp being at an angle from 10 degrees to 80 degrees to a line perpendicular to said longitudinal axis, and wherein said mud flow ramp has a top;

a junk slot defined by said mudflow ramp, drill bit body, and a junk slot boundary line;

a first rolling cone rotatably attached to said drill bit body,

and wherein said junk slot has a cross-sectional area at each height along said junk slot and said cross-sectional area of said junk slot is greater at its top than at its bottom, and wherein a cross-sectional area exists between said nozzle boss and said mudflow ramp, said cross-sectional area increasing from said bottom of said nozzle boss to said top of said nozzle boss.

37. (cancelled).

38. (Original) The rolling cone rock bit of claim 23, wherein said bit body has cylindrical shape.

39. (Original) The rolling cone rock bit of claim 23, wherein said bit body has an conical shape.

40. (Previously presented) The rolling cone rock bit of claim 23, wherein said bit body has a revolved shape.

41. (Original) The rolling cone rock bit of claim 23, further comprising:

a grease reservoir located on the top of the mud flow ramp.

42. (Previously presented) A rolling cone rock bit, comprising:

a drill bit body defining a longitudinal axis, a top, and a bottom;

a first leg formed from said drill bit body, said first leg providing a mud flow ramp from a leading edge of said first leg, wherein said mud flow ramp is disposed at an angle to said longitudinal axis, and wherein said mud flow ramp has a top;

a junk slot defined by said mudflow ramp, drill bit body, and a junk slot boundary line;

a first rolling cone rotatably attached to said drill bit body,

wherein said junk slot has a cross-sectional area at each height along said junk slot and said cross-sectional area of said junk slot is greater at its top than at its bottom and further wherein there exists a grease reservoir located on the mud flow ramp surface.

43. (Original) The rolling cone rock bit of claim 23, wherein said first leg is backturned.

44. (Original) The rolling cone rock bit of claim 23, further comprising:

a nozzle attached to said drill bit body; and

a fluid flow channel formed between said nozzle and said mud flow ramp.

45. (Currently amended) ~~The rolling cone rock bit of claim 43,~~ A rolling cone rock bit, comprising:

a drill bit body defining a longitudinal axis, a top, and a bottom;

a nozzle boss having a bottom and a top;

a first leg formed from said drill bit body, said first leg providing a mud flow ramp from a leading edge of said first leg, wherein said mud flow ramp is disposed at an angle to said longitudinal axis, at least a portion of said mud flow ramp being at an angle from 10 degrees to 80 degrees to said longitudinal axis, and wherein said mud flow ramp has a top;

a junk slot defined by said mudflow ramp, drill bit body, and a junk slot boundary line;

a first rolling cone rotatably attached to said drill bit body,

wherein a side wall forming said nozzle boss also forms a side wall to a leg; and

wherein said junk slot has a cross-sectional area at each height along said junk slot and said cross-sectional area of said junk slot is greater at its top than at its bottom, and wherein a cross-sectional area exists between said nozzle boss and said mudflow ramp, said cross-sectional area increasing from said bottom of said nozzle boss to said top of said nozzle boss.

46. (Currently Amended) ~~The rolling cone rock bit of claim 23,~~ A rolling cone rock bit, comprising:

a drill bit body defining a longitudinal axis, a top, and a bottom;

a nozzle boss having a bottom and a top;

a first leg formed from said drill bit body, said first leg providing a mud flow ramp from a leading edge of said first leg, wherein said mud flow ramp is disposed at an angle to said longitudinal axis, at least a portion of said mud flow ramp being at an angle from 10 degrees to 80 degrees to said longitudinal axis, and wherein said mud flow ramp has a top and wherein said first leg has a backface at the periphery of said drill bit body, and said backface is parallel to said longitudinal axis;

a junk slot defined by said mudflow ramp, drill bit body, and a junk slot boundary line;

a first rolling cone rotatably attached to said drill bit body,

wherein said junk slot has a cross-sectional area at each height along said junk slot and said cross-sectional area of said junk slot is greater at its top than at its bottom, and wherein a cross-sectional area exists between said nozzle boss and said mudflow ramp, said cross-sectional area increasing from said bottom of said nozzle boss to said top of said nozzle boss.

47. (Original) The rolling cone rock bit of claim 23, wherein said first leg has a backface at the periphery of said drill bit body, said backface being tapered at an angle to said longitudinal axis.

48. (Previously presented or Currently amended) The rolling cone rock bit of claim 47, wherein said angle is less than ½ degree.

49. (Previously presented or Currently amended) The rolling cone rock bit of claim 24, where said cross-sectional area of said junk slot continuously increases from said bottom of said nozzle boss to said top of said mud ramp.

50. (Currently amended) The rolling cone rock bit of claim 24, where said cross-sectional area of said junk slot at said top of said mud ramp is at least 15% greater than said cross-sectional area of said junk slot at said bottom of said nozzle boss.

51. (Currently amended) The rolling cone rock bit of claim 24, where said cross-sectional area of said junk slot at said top of said mud ramp is at least 100% greater than said cross-sectional area of said junk slot at said bottom of said nozzle boss.

52. (Currently amended) The rolling cone rock bit of claim 24, where said cross-sectional area of said junk slot at said top of said mud ramp is between 15% and 600% greater than said cross-sectional area of said junk slot at said bottom of said nozzle boss.

53 -64 (canceled).

65. (Previously presented) The drill bit of claim 23, said drill bit including a pin shoulder proximate said top of said drill bit body, wherein said mud flow ramp has a width from said pin shoulder to a peripheral edge of said first leg.

66. (Currently amended) The drill bit of claim 23, said drill bit including a pin shoulder proximate said top of said drill bit body, wherein said mud flow ramp has a constant width along its entire length from said pin shoulder to a peripheral edge of said first leg.

67. (Previously presented) The drill bit of claim 23, wherein said cross-sectional area generally increases along the length of said mud flow ramp.

68. (Previously presented) The drill bit of claim 23, wherein said cross-sectional area continuously increases along the length of said mud flow ramp.

69. (New) The drill bit of claim 23, wherein at least a portion of said mud flow ramp is at an angle from 30 degrees to 80 degrees to said line perpendicular to said longitudinal axis.

70. (New) The drill bit of claim 23, further comprising:

a bottom for said mud flow ramp;

a pin shoulder proximate said top of said drill bit body;

wherein said mud flow ramp has a constant width from said mud flow bottom to said mud flow top.

71. (New) The drill bit of claim 70, further comprising:

a pin shoulder proximate said top of said drill bit body;

wherein said width is from said pin shoulder to a peripheral edge of said first leg.

72. (New) The drill bit of claim 70, said width being one and one half inches on a drill bit of eight and three-quarters inches.

73. (New) The drill bit of claim 23, said first section being more proximate said bottom of said drill bit body than second section, said second section being at a greater angle to said line parallel to said longitudinal axis than said first section.

74. (New) The drill bit of claim 28, said first section being more proximate said bottom of said drill bit body than second section, said second section being at a greater angle to said line parallel to said longitudinal axis than said first section.

75. (New) The drill bit of claim 23, said mud flow ramp being formed from said drill bit body.

76. (Original) The rolling cone rock bit of claim 23, wherein said mud flow ramp includes a convex section.

77. (Original) The rolling cone rock bit of claim 23, wherein said mud flow ramp is a set of continuous curves.

78. (New) The drill bit of claim 23, further comprising:

a first side face region proximate said upper end of said first leg;

a first array of inserts attached to said first side face region;

79. (New) The drill bit of claim 78, further comprising:

a second leg formed from said drill bit body, said second leg having a top and a bottom;

a second side face region proximate said upper end of said second leg; and

a second array of inserts attached to said second side face region.

80. (New) The rolling cone rock bit of claim 79, wherein from 150 degrees to 360 degrees around the circumference of said rock bit has inserts, including said side face regions, on said rock bit.

81. (New) The rolling cone rock bit of claim 79, wherein from 180 degrees to 360 degrees around the circumference of said rock bit has inserts, including said side face regions, on said rock bit.

82. (New) The rolling cone rock bit of claim 79, wherein said first array of inserts are active inserts.

83. (New) The rolling cone rock bit of claim 79, wherein said first array of inserts are non-active inserts.

84. (New) The rolling cone rock bit of claim 79, wherein said first array of inserts extend to gage diameter.

85. (New) A rolling cone rock bit, comprising:

a drill bit body defining a longitudinal axis, and including a top end and a bottom end;

a first leg formed from said drill bit body, said first leg having a top and a bottom;

a first side face region proximate said upper end of said first leg;

a first array of inserts attached to said first side face region;

said first leg providing a mud flow ramp from a leading edge of said first leg, wherein said mud flow ramp is disposed at an angle to a line perpendicular to said longitudinal axis, at least a portion of said mud flow ramp being at an angle from 10 degrees to 80 degrees to said line perpendicular to said longitudinal axis, and wherein said mud flow ramp has a top and a bottom;

a junk slot defined by said mudflow ramp, said drill bit body, and a junk slot boundary line;

a first rolling cone rotatably attached to said first leg at said bottom end of said drill bit body;

wherein said junk slot has a cross-sectional area at each height along said junk slot and said cross-sectional area of said junk slot is greater at its top than at its bottom

86. (New) The rolling cone rock bit of claim 85,

wherein a cross-sectional area exists between said nozzle boss and said mudflow ramp, said cross-sectional area increasing from said bottom of said nozzle boss to said top of said nozzle boss.

87. (New) The rolling cone rock bit of claim 85, further comprising:

a second leg formed from said drill bit body, said second leg having a top and a bottom;

a second side face region proximate said upper end of said second leg; and

a second array of inserts attached to said second side face region.

88. (New) The rolling cone rock bit of claim 85, wherein from 150 degrees to 360 degrees around the circumference of said rock bit is covered by inserts.

89. (New) The rolling cone rock bit of claim 85, wherein from 180 degrees to 360 degrees around the circumference of said rock bit is covered by inserts.

90. (New) The rolling cone rock bit of claim 85, wherein said first array of inserts are active inserts.

91. (New) The rolling cone rock bit of claim 85, wherein said first array of inserts are non-active inserts.

92. (New) A drill bit for use in a borehole, comprising:

a drill bit body defining a longitudinal axis,

a leg on a side of said drill bit body; and

a mud ramp formed from said leg, said mud ramp having a surface for pumping mud from a borehole bottom;

wherein said surface of said mud ramp has a first portion corresponding to a first angle from said longitudinal axis, and a second portion corresponding to a second angle from said longitudinal axis, where said second angle is different from said first angle.

93. (New) The drill bit of claim 92, wherein said first portion is a first straight section.

94. (New) The drill bit of claim 93, wherein said second portion is a second straight section.

95. (New) The drill bit of claim 92, wherein said first portion is a first point on a first curve and said first angle is measured from a tangent to said first point.

96. (New) The drill bit of claim 92, wherein said first portion is a first point on a first curve and said first angle is measured from a tangent to said first point.

97. (New) The drill bit of claim 23, said drill bit including a pin shoulder proximate said top of said drill bit body, wherein said mud flow ramp has a width from said pin shoulder to a peripheral edge of said first leg and said angles are measured with respect to said peripheral edge.

98. (New) The drill bit of claim 23, wherein said mud flow ramp extends to a peripheral edge of said first leg and said angles are measured with respect to said peripheral edge.

99. (New) The drill bit of claim 23, said inserts being located between 180 degrees and 260 degrees around said drill bit body.

100. (New) The rolling cone rock bit of claim 23, wherein said inserts are active inserts.

101. (New) The rolling cone rock bit of claim 23, wherein said inserts are non-active inserts.

102. (New) The rolling cone rock bit of claim 99, wherein said inserts are active inserts.

103. (New) The rolling cone rock bit of claim 99, wherein said inserts are non-active inserts.